

Chapter 13

Northumberland Trough and Solway Basin

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Carboniferous rocks within this region occupy a broadly east–west graben, referred to as the Northumberland Trough within Northumberland (Bewcastle to the North Sea coast) and the Solway Basin in the vicinity of the Solway Firth, where much of the succession is obscured by Permo-Triassic strata (Fig. 13.1). The graben is bounded to the south by the Maryport-Stublick-Ninety Fathom Fault System, which forms the northern boundary of the Lake District and Alston blocks (see Chapter 12). The Carboniferous rocks are broadly separated from the Midland Valley of Scotland (Chapter 14), to the north, by the Lower Palaeozoic rocks of the Southern Uplands, which formed an emergent upland area throughout much of the Carboniferous, with local deposition within small basins. At the eastern onshore extent of the Southern Uplands a relatively condensed Carboniferous succession was deposited upon the Cheviot Block.

All of the regional stages of the Carboniferous are present at outcrop, though strata of Stephanian age have not been proved biostratigraphically. The oldest Tournaisian strata occur at outcrop along the northern margins of the Northumberland Trough-Solway Basin, represented by alluvial and peritidal deposits, typically separated by volcanic rocks (Inverclyde Group). These strata extend offshore within the North Sea (Chapter 15), linking directly with the outcrop of Inverclyde Group present within the Midland Valley of Scotland. Within the Northumberland Trough-Solway Basin, the Inverclyde Group passes southwards into, and is overlain by, an lower to middle Visean heterolithic clastic and non-marine carbonate and fluvio-deltaic succession (Border Group). The middle to upper Visean succession above the Cheviot Block is dominated by relatively condensed fluvio-lacustrine and Yoredale facies deposits, which pass southward into the relatively deeper water mixed shelf carbonate and deltaic deposits of the Northumberland Trough (Yoredale Group).

Namurian and Westphalian strata occur at outcrop toward the south and east of the region within the Northumberland Coalfield, with the succession broadly younging towards the east (Fig. 13.1). Small outliers also occur in the Canonbie and Midgeholme coalfields. The Canonbie Coalfield extends southwards beneath Permo-Triassic strata to link with the Cumbrian Coalfield (Chapter 12). The early Namurian strata represent a continuation of the Yoredale facies deposits, although with a gradual decrease in the number and thickness of marine carbonate units and dominance of fluvio-deltaic deposits (Yoredale Group). The overlying Westphalian strata are dominated by fluvio-lacustrine deposits (Pennine Coal Measures Group), with subsequent deposition of late Westphalian red-bed alluvial deposits (Warwickshire Group) locally preserved in the Canonbie Coalfield.

The lithostratigraphical nomenclature is that of Waters *et al.* (2007) and Dean *et al.* (2011).

Tournaisian

The Inverclyde Group, deposited upon the flanks of the Southern Uplands High, crops out in the Solway Basin (Fig. 13.2, Cols. 1 & 2) and northeast Northumberland (Col. 7). The Kinnesswood Formation, composed mainly of sandstone with red mudstone and calcrete, developed as alluvial fans deposited in a series of small, linked basins with internal drainage that formed along parts of the northern margin of the Northumberland Trough during early stages of crustal extension (Chadwick *et al.* 1995). The formation is typically included within the Old Red Sandstone Group by many previous workers (Lumsden *et al.* 1967; George *et al.* 1976), though a Courceyan age is postulated by these authors for at least the upper part of the formation. The Ballagan Formation, comprising interbedded sandstone, mudstone, limestone and anhydrite, represents both alluvial fan, fluvial and fluvio-deltaic sediments sourced from the Southern Uplands High, intercalated with lacustrine and arid coastal plain deposits. The formation has been variously referred to in the Solway Basin as the Kirkbean Cementstone Formation (Lintern & Floyd 2000), an unnamed part of the Lower Border Group (Lumsden *et al.* 1967) and in the Solway Basin-Northumberland Trough as the Cementstone Group (e.g. Fowler 1926). In the central part of the Northumberland Trough a lateral facies change sees the upper part of the Ballagan Formation pass into the Lyne Formation of the Border Group (Fig. 13.2, Col. 3). Locally, the Kinnesswood and Ballagan formations are separated by the Birrenswark Volcanic and Kelso Volcanic formations in the Solway Basin (Lumsden *et al.* 1967) and Berwick-Upon-Tweed area (Greig 1988), respectively (Fig. 13.2, Cols. 1, 2 & 7). Whole rock K-Ar dates for the Birrenswark Volcanic and Kelso Volcanic formations of 361 ± 7 Ma (de Souza 1982), would suggest a latest Famennian age.

Visean

The Border Group (Tournaisian-early Visean) was deposited within the axis of the Northumberland Trough – Solway Basin and the Cheviot Block. In the Solway Firth (Fig. 13.2, Col. 1) the Lyne Formation (former Southernness Limestone Formation) at Kirkbean, comprises cyclical sequences of sandstone, siltstone, mudstone and thin limestone (Lintern & Floyd 2000). Coastal-marine shelly faunas contain abundant brachiopods including *Antiquatonia teres*, *Pustula pyxidiformis* and the corals *Palaeosmilia murchisoni* and *Michelinia megastoma*, indicative of Chadian to possibly Arundian age *¹ (George *et al.* 1976). In the Bewcastle area (Fig. 13.2, Col. 3) the formation is subdivided into the Lynebank, Bewcastle, Main Algal and Cambeck members (Day *et al.* 1970; Dean *et al.* 2011). W. J. Varker, in Ramsbottom (1977), reported the presence of Chadian foraminifers and conodonts *Mestognathus beckmanni* and *Polygnathus bischoffi*, indicating a latest Tournaisian to Chadian age for the basal part of the Lynebank Member ⁰¹. The limestones are typically peritidal, containing stromatolites and vermetid gastropod bioherms and biostromes. Brachiopod–coral assemblages found in the Cambeck Member are typical of the C₂ Zone *² (Day *et al.* 1970) of late Chadian to early Arundian age. In the Easton No 1 Borehole [NY 44124 71694], 16 km north of Carlisle, subaqueous anhydrite beds form a significant component of a 1153 m thick cyclical succession, the base of which was not proved (Ward 1997). Formally defined as the Easton Anhydrite Member by Dean *et al.* (2011), the member may be overlain by the equivalent of the Main Algal Member. The formation has not been proved in the eastern part of the Northumberland Trough, and north of Berwick-upon-Tweed area (Fig. 13.2, Col. 7) is

absent, with the Fell Sandstone Formation with a markedly erosive base resting unconformably upon strata of the Inverclyde Group (Greig 1988).

Deposition of the Fell Sandstone Formation occurred earliest in the north-east of the Northumberland Trough (Chadian to Holkerian) as both braided and meandering river systems (Turner *et al.* 1993). In the central part of the trough and in the Solway Basin, the equivalent strata are of Arundian to Holkerian age and represent deposition in a mixed fluvio-deltaic and shallow marine environment. Within this central area (Fig.13.2, Col. 3 ^{*3}), the base of the formation is conformable on the Lyne Formation, defined at the base of the early Arundian Whitberry Band, including the distinctive chonetoidean *Rugosochonetes cumbriensis* (Day 1970). In the Brampton area (Fig. 13.2, Col. 4 ^{^1}) and the Marshall Meadows Borehole [NT 9797 5685] near Berwick-upon-Tweed (Col. 7 ^{^1}) the uppermost part of the Fell Sandstone Formation succession contains miospores of the TS (formerly upper Pu) Zone (Neves *et al.* 1973).

The succeeding Yoredale Group extends across the entire Solway Basin and Northumberland Trough, with the Tyne Limestone Formation, broadly of Asbian age, overlain by the Brigantian Alston Formation.

In the Solway Basin at Kirkbean-Arbigland Bay (Fig. 13.2, Col. 1) the base of the Asbian lies within the middle part of the Arbigland Limestone Member, taken at the first appearance of a coral-brachiopod fauna comparable with the Clattering Band ^{*2} (George *et al.* 1976). In the Archerbeck Borehole [NY 4156 7815] (Fig. 13.2, Col. 2) the lower part of the Tyne Limestone Formation, including the Glencartholm Volcanic Member contains miospores of the TC Zone ^{^1} (Neves *et al.* 1973). Within the central part of the Northumberland Trough (Fig. 13.2, Cols. 3 ^{*4} & 5 ^{*1}) the base of the Tyne Limestone Formation is taken at the base of a marine limestone with a distinctive coral/brachiopod fauna of *Siphonodendron martini*, *Lithostrotion portlocki* and *Semiplanus* marking the base of the Asbian Substage, e.g. Kingbridge Limestone in the Bellingham area (Frost & Holliday 1980), and the Clattering Band in the Bewcastle area (Day *et al.* 1970). In the Brampton area (Fig. 13.2, Col. 4) the ammonoid *Beyrichoceratoides redesdalensis* of B₁-B_{2a} Zones age is recorded from the Redesdale Ironstone Shale in the upper part of the Tyne Limestone Formation ⁺² (George *et al.* 1976). In northeast Northumberland (Fig. 13.2, Col. 7) the Marshall Meadows Borehole proves the Scremerston Coal Member lies within the TS ^{^2} (formerly upper Pu) and TC miospore zones, with the top taken at the base of the Dun Limestone Member, which contains NM miospore assemblage in this borehole ^{^*3} (Neves *et al.* 1973). At Berwick-on-Tweed (Fig. 13.2, Col. 7 ^{^*3}) the Dun Limestone Member contains the colonial coral *Siphonodendron junceum* (Fowler 1926), supporting an Asbian age. The top of the Dun Limestone Member represents the top of the Tyne Limestone Formation (Dean *et al.* 2011), and can be traced throughout the Northumberland Trough (Frost & Holliday 1980).

The base of the Alston Formation is taken at marker limestones used to define the base of the Brigantian Substage. This includes the Callant Limestone of the Solway Basin, and the Low Tipalt Limestone of the Bewcastle and Brampton areas in the central part of the Northumberland Trough, and the Watchlaw Limestone in the north-

eastern parts of the Northumberland Trough (George *et al.* 1976; Frost & Holliday 1980). The Callant Limestone, present in the Archerbeck Borehole (Fig. 13.2, Col. 2), marks the transition from NM to VF Zone miospores^{^2} (Neves *et al.* 1973). A recent proposal by Owens *et al.* (2004) is to replace the NC miospore Zone in the upper part of the Brigantian with a new CN Biozone and a new subzone (Cc), see Chapter 3. The base of this zone and subzone, which coincides with the P_{2b}-P_{2c} ammonoid boundary, is defined in a section near Hayden Bridge in Northumberland.

Namurian

The base of the Namurian is taken a few metres below the base of the Great Limestone Member, the uppermost limestone unit of the Alston Formation (Dean *et al.* 2011), which can be traced throughout the Northumberland Trough and Solway Basin (Holliday *et al.* 1975). The diagnostic Pendleian (E₁) ammonoid *Cravenoceras* (= *Emstites*) *leion* has been recorded from below the Great Limestone Member (Dunham 1990) and a change in foraminiferal assemblage at the base of the Catsbit Limestone (local equivalent of the Great Limestone Member) in the Archerbeck Borehole (Fig. 13.2, Col. 8⁰¹) suggests the base of the Namurian occurs at this level (Cummings 1961).

Above the Great Limestone Member, the Yoredale Group is represented by the Stainmore Formation, which ranges throughout the Namurian. The Stainmore Formation is distinguishable from the underlying Alston Formation by a decrease in the number and thickness of limestone units. The upper part of the Namurian succession is notably distinctive from the underlying Stainmore Formation, with an absence or presence of only thin limestones within the Yoredale cycles and the occurrence of thick, often pebbly, coarse-grained sandstone units with ribbon-like geometries. These fluvial sandstones have historically been mapped as the First and Second Grit of “Millstone Grit” facies (Ramsbottom *et al.* 1978, fig. 9), although the correlation of such a simple stratigraphy for a complex of channel sandstone bodies is now questioned.

In the Canonbie Coalfield (Fig. 13.2, Col. 8) the Stainmore Formation shows a thickness variation from 425 m in the flanks of the syndepositional Solway Syncline to c. 600 m in the core of the syncline (Chadwick *et al.* 1995, map 12). The Archerbeck Ochre Bed, a marine sandstone above the Penton coals in the Archerbeck Borehole, is considered to be of late Pendleian age from the presence of the bivalve *Streblopteria ornata*^{~2} (Ramsbottom *et al.* 1978). In the Throckley Borehole [NZ 1456 6762] (Fig. 13.2, Col. 10^{^1}) miospores of Pendleian age are proved between the Great Limestone and Pike Hill Limestone, the base of the Arnsbergian Substage occurring above the Thornbrough Limestone (Owens 1972), whereas foraminifers in the nearby Rowlands Gill Borehole [NZ 1664 5815] would suggest the base occurs at a lower level, the base of the Lower Fell Top Limestone⁰² (Riley 1992b). Miospores indicative of the E_{2b} Subzone are recorded in the Throckley Borehole between the Newton and Styford limestones^{^3} (Owens 1972; Owens *et al.* 2004). The E_{2b} age of these limestones is confirmed elsewhere in the Newcastle area by the presence of the nautiloid *Tylonautilus nodiferus* (Mills & Holliday 1998).

The Chokierian and Alportian mudstone-dominated successions are condensed, typically as little as 5 m thick, though there is no evidence of a regional unconformity at this level in the Newcastle area (Mills & Holliday 1998).

The upper part of the Namurian succession is sandstone dominated, lacking limestone typical of the remainder of the Yoredale Group, and comparable with the late Namurian “Millstone Grit” facies recognised on the Alston Block (see Chapter 12). The first appearance of common *Crassispora kosankei* miospores about 14 m above the base of the first thick sandstone (“First Grit”) in the Throckley Borehole (Fig. 13.2, Col. 10⁴) marks the base of the KV Zone (Stephenson *et al.* 2008) of Kinderscoutian age.

The upper 140 m of the Stainmore Formation in the Langholm area (Fig. 13.2, Col. 8), includes strata of the FR miospore Zone³ (late Marsdenian to Yeadonian age) in the Rowanburnfoot Borehole [NY 4103 7574] (Owens 1980).

In the Midgeholme Coalfield (Fig. 13.2, Col. 9) the 82 m-thick succession between the Namurian Burnfoot Shales and the Low Main Coal was interpreted as Lower Coal Measures by Trotter & Hollingworth (1932), but may in part include Namurian strata equivalent to the Millstone Grit Group.

Westphalian

During the Langsettian to early Bolsovian, the grey, mudstone-dominated fluvio-lacustrine deposits (Pennine Coal Measures Group) were deposited across the region. The Pennine Coal Measures Group crops out in the Canonbie Coalfield of the Solway Basin (Fig. 13.2, Col. 8), as a series of outliers immediately to the north of the Stublick Fault, along the southern margin of the Northumberland Trough (Fig. 13.1), the largest of which is the Midgeholme Coalfield (Fig. 13.2, Col. 9), and the Northumberland Coalfield (Cols. 6, 10 & 11), the northward continuation of the Durham Coalfield (see Chapter 12). During the Asturian (Westphalian D), red mudstone- and sandstone-dominated alluvial successions (Warwickshire Group) may have been widespread, but are now only recorded in the Canonbie Coalfield (Fig. 13.2, Col. 8). Inversion of the basin during late Carboniferous deformation may have resulted in the erosion of much of the Warwickshire Group.

None of the marine bands recognised within the Westphalian succession of the region contain diagnostic ammonoid fauna and biostratigraphical zonation is dependent upon non-marine bivalves. In the Canonbie Coalfield (Fig. 13.2, Col. 8; Fig. 13.3), Lumsden *et al.* (1967) recorded a thin (c. 30 m), sandstone-dominated Pennine Lower Coal Measures on the flank of the Solway Syncline, which they determined occurred within the *Modiolaris* Chronozone⁵. They demonstrated evidence that most of the Langsettian succession was absent beneath an angular unconformity. However, Owens (1980) recorded miospores of the RA Zone in the Rowanburnfoot Borehole⁴, 5 m below the proposed unconformity and that the base of the Westphalian occurs within the underlying conformable succession. Subsequent work has argued that the unconformity is in fact a shear surface associated with channel bank collapse (Jones & Holliday 2006). In the Midgeholme Coalfield (Fig. 13.2, Col. 9; Fig. 13.3) there is

uncertainty as to the location of the base of the Pennine Coal Measure Group, which may have been taken by Trotter & Hollingworth (1932) at the base of a late Namurian sandstone. Some 90 m of Pennine Lower Coal Measures of the *Communis* and *Modiolaris* chronozones are recorded in the Plenneller Coalfield (Turner 1999). The inferred position of the Subcrenatum Marine Band in the Throckley Borehole (Fig. 13.2, Col. 10) and in the Newcastle area (Mills & Holliday 1998) is taken at a *Lingula* band. In the Northumberland Coalfield, the base of the *Communis* and *Modiolaris* chronozones are taken at the Ganister Clay and Top Busty coals, respectively (Fig. 13.3; Land 1974; Mills & Holliday 1998).

The Vanderbeckei Marine Band, which defines the bases of the Duckmantian Substage and the Pennine Middle Coal Measures Formation, is present in the Canonbie Coalfield as a *Lingula* band, with the overlying succession of the *Modiolaris* Chronozone dominated by relatively thick coals (Fig. 13.3). In the Tynemouth region the marine band comprises *Lingula mytilloides*, fish remains and rare foraminifers (Land 1974).

Across the region, strata of the Lower Similis-Pulchra Chronozone comprise thinner coals and includes the Houghton and Sutton marine bands (Ramsbottom *et al.* 1978), represented by *Lingula* bands. The base of the chronozone is taken at the base of the Nine Foot Coal (Fig. 13.3) in the Canonbie Coalfield (Lumsden *et al.* 1967) and Bensham Coal in the Northumberland Coalfield (Land 1974; Mills & Holliday 1998).

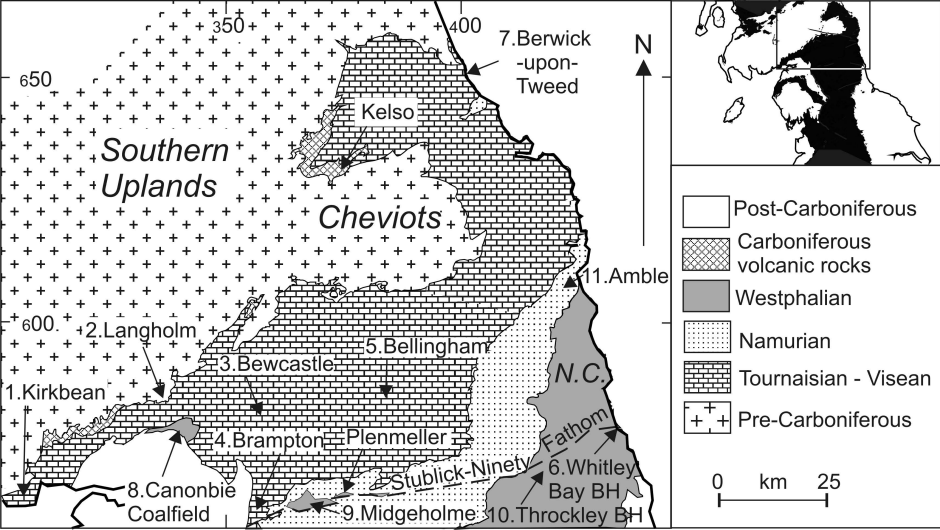
The base of the Aegiranum Marine Band defines the base of the Bolsovian Substage and was previously taken by Lumsden *et al.* (1967) to mark the base of the Upper Coal Measures. The top of the Pennine Middle Coal Measures is now defined at the top of the Cambriense Marine Band and the Pennine Upper Coal Measures Formation is largely absent in this region. The upper part of the Pennine Middle Coal Measures Formation, is typically arenaceous with thin coals and includes four regionally developed marine bands, the Aegiranum, Edmondia, Shafton and Cambriense marine bands (Ramsbottom *et al.* 1978) evident as *Lingula* bands. This upper part of the formation occurs within the Upper Similis-Pulchra Chronozone, although no non-marine bivalves are recorded in either the Canonbie or Northumberland coalfields (Lumsden *et al.* 1967; Land 1974).

In the Canonbie Coalfield the grey, coal-rich Pennine Coal Measures Group is overlain conformably by red, coal-poor Warwickshire Group (Fig. 13.2, Col. 8). Only strata of the Tenuis Chronozone⁶ (Asturian) have been proved within the lowermost mudstone-dominated Eskbank Wood Formation (Jones *et al.* 2010). The overlying Canonbie Bridge Sandstone Formation is dominated by lithic arenite of similar provenance as the Halesowen Formation (Jones *et al.* in press) of the southern part of the Pennine Basin (see Chapter 9). The youngest formation is the Becklees Sandstone Formation, which is unconformably overlain by Permian strata (Fig. 13.2, Col. 8; Jones *et al.* 2010). Up to 750 m of Warwickshire Group are recorded on the flank of the Solway Syncline (Lumsden *et al.* 1967), although seismic reflection profiles (Chadwick *et al.* 1995, map 14) suggest a thickness in excess of c. 1200 m within the axial region.

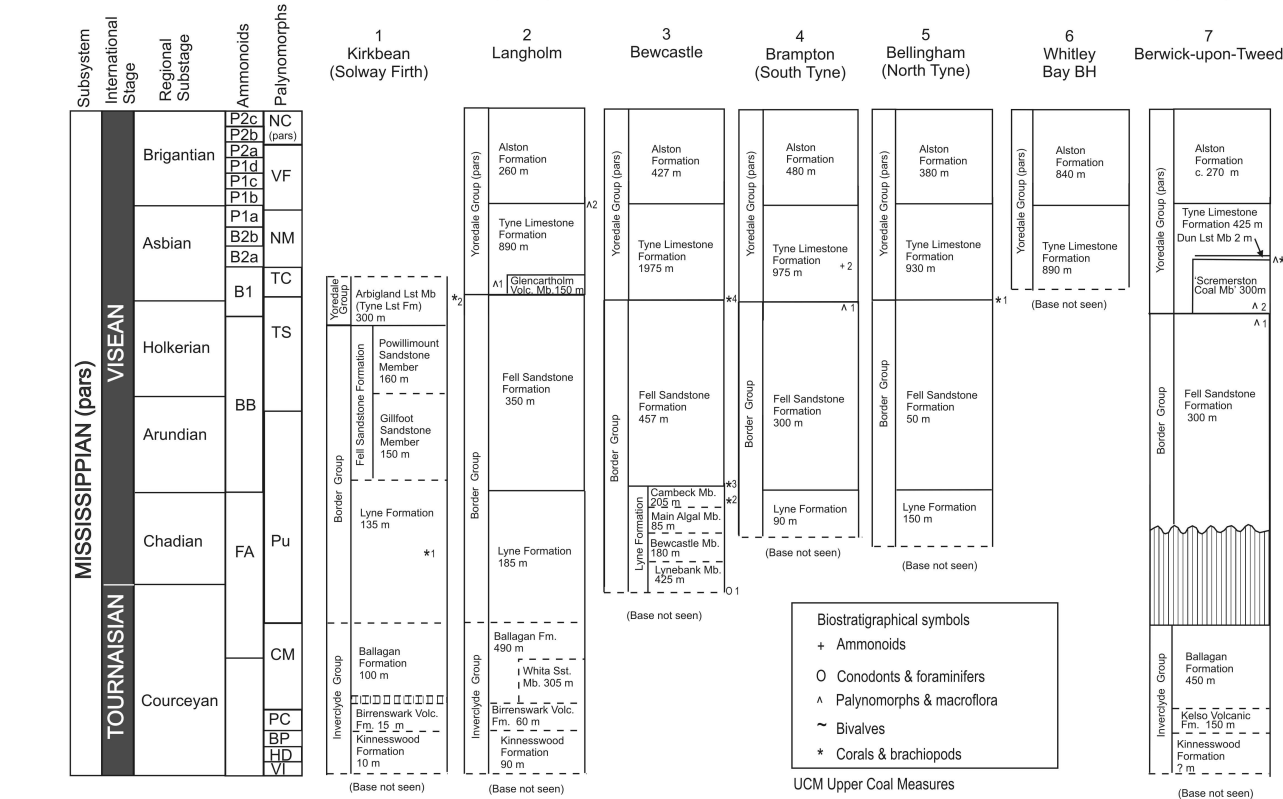
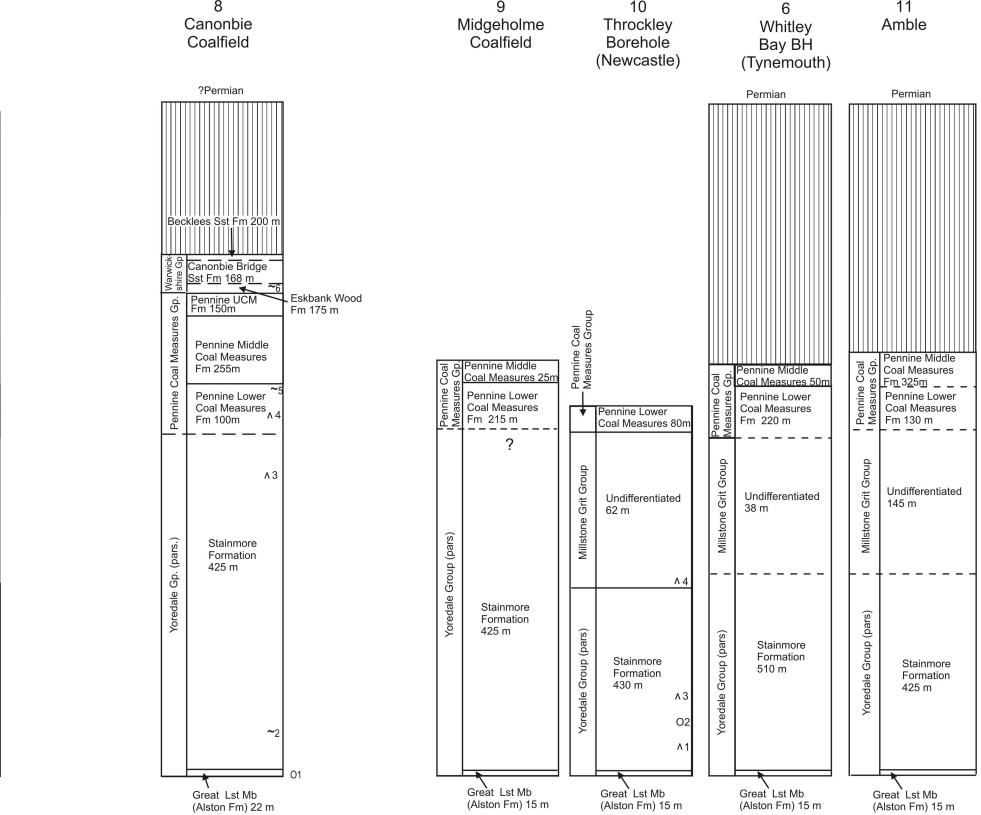
Fig. 13.1. Geological map showing the distribution of Carboniferous strata from the Northumberland Trough and Solway Basin, adapted from IGS (1979).

Fig. 13.2. Correlation of Carboniferous successions in Northumberland Trough and Solway Basin. The nomenclature is that of Waters *et al.* (2007) and Dean *et al.* (2011), with details from the following publications: Col. 1 from Lintern & Floyd (2000); Col. 2 from Lumsden *et al.* (1967); Col. 3 from Day *et al.* (1970); Col. 4 from Trotter & Hollingworth (1932); Col. 5 from Frost & Holliday (1980); Col. 6 from Land (1974); Col. 7 from Fowler (1926) and Greig (1988); Col. 8 from Picken (1988) and Jones & Holliday (2006); Col. 9 from Trotter & Hollingworth (1932); Col. 10 from Mills & Holliday (1998); Col. 11 from Lawrence (in press).

Fig. 13.3 Correlation of Westphalian strata, showing named coals, sandstones and marine bands. Langholm (Canonbie Coalfield) from Lumsden *et al.* (1967), Picken (1988) and Jones & Holliday (2006); South Tyne (Midgeholme & Stublick coalfields) from Trotter & Hollingworth (1932), Ramsbottom *et al.* (1978) and Turner (1999); Whitley Bay – Tynemouth area from Land (1974) and Amble – Ashington from Lawrence (in press).



PENNSYLVANIAN	MISSISSIPPIAN (pars)	SERPUKHOVIAN	NAMURIAN	E1a	NC (pars)
				E1b	TK
				E2a	SO
				E2c	KV
				E1c	FR
	BASHKIRIAN	WESTPHALIAN	STEPHANIAN	G2	SS
				G1b	RA
				G1a	NJ
				R2c	SL
				R2b	OT
KASIMOVIAN	MOSCOWIAN	LOVIAN	R2a	ST	
			R1c	NBM	
			R1b		
			R1a		
			R2c		
Subsystem	International Stage	Regional Substage	Ammonoids	Palynomorphs	



Biostratigraphical symbols

- + Ammonoids
- O Conodonts & foraminifers
- △ Palynomorphs & macroflora
- ~ Bivalves
- * Corals & brachiopods

UCM Upper Coal Measures

(Base not seen)

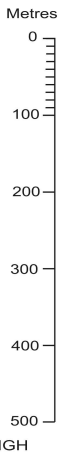
(Base not seen)

(Base not seen)

REGIONAL STAGE	REGIONAL SUBSTAGE	GROUP	FORMATION
? STEPHANIAN	?	WARWICKSHIRE	BECKLEES SANDSTONE
WESTPHALIAN	?	BOLSOVIAN	ESBANK WOOD
			DICKMANTIAN
LANGSETTIAN	PENNINE COAL MEASURES	PENNINE MIDDLE COAL MEASURES	
		PENNINE LOWER COAL MEASURES	

Langholm (Canonbie Coalfield)

c.540m of WAWK proven in boreholes and a further c.210m inferred from seismic data



- Sandstone
- Red beds
- Non-marine ('*Spirorbis*') limestone
- Coal
- m - Marine band (M.B.)
- e - '*Estheria*' band

South Tye (Midgeholme & Stublick coalfields)

Whitley Bay - Tynemouth area

Amble-Ashington

Langley M.B.
Vanderbeckei M.B.
Seven Foot
Black Top
Five Foot
Nine Foot
Six Foot
Archerbeck
Haughton M.B.
Aegiranum M.B.
Edmondia M.B.
Shafton M.B.
Cambriense M.B.

Lower Kella
Upper Kella
Low Main (Cannel)
Midgeholme (Slag)
Well Syke (Main)
Half
Three-Quarter (Foot)
Bottom Busty
Top Busty
Bellium
Boulder
Vanderbeckei M.B.

Cambriense M.B.
CLOUDSEN HILL
KILLINGWORTH
WEST MOOR
HEBBURN FELL
USWORTH
Burradon
Rowlington
Ryhope Five Quarter
Ryhope Little
Moorland
Ashington
High Main
Five Quarter
Bentnick (Top Yard)
Yard
Gensham (Maudlin)
Durham Low Main
Northumberland Low Main
Plessey
Cheveley
Beaumont
Bellium
Top Busty
Bottom Busty
Three-Quarter
Brockwell
Victoria
Marshall Green
Ganister Clay
Gubeon
Saltwick
Subcrenatum M.B.
Amaliae M.B.

USWORTH
Burradon
Rowlington
Ryhope Five Quarter
Ryhope Little
Moorland
Ashington
High Main
Five Quarter
Bentnick (Prince)
Yard (Albert)
Top Gensham
Durham (Queen)
Northumberland Low Main
Bottom Hill Main (Dore)
Plessey
Bottom Plessey
Beaumont
Bottom Beaumont
Tilly (Widdrington Yard, Givens)
Top Busty (Widdrington Five Quarter)
Bottom Busty (Widdrington Main)
Three Quarter
Stobwood New
Brockwell
Victoria
Marshall Green
Ganister Clay
Subcrenatum M.B.

	STANDARD NAMES	LOCAL NAMES	
		Canonbie	Northumberland
BOLSOVIAN	Cambriense	Riddings	Down Hill
	Shafton	Rowanburnfoot	
	Edmondia	Viaduct	
	Aegiranum	Kelton	Ryhope
DUCKMANTIAN	Sutton	Knottyholm	Hylton
	Haughton	Sandwich	Kirkby's
	Clown		Little
	Maltby		High Main
LANGSETTIAN	Vanderbeckei	Queenslie	Harvey
	Burton Joyce	Templeman's	?Stobwood
	Langley		Gubeon
	Amaliae		
	Meadow Farm	Kays Lea	
	Parkhouse		
	Lister		
Honley			
Springwood			
Holbrook			
Subcrenatum		Quarterburn	